UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/830,306	04/25/2001	David John Benjamin Pearce	CM00620P	6704

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EXAMINER
WOZNIAK, JAMES S

ART UNIT	PAPER NUMBER
2655	

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Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	09/830,306	PEARCE ET AL.
	Examiner	Art Unit
	James S. Wozniak	2655

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 November 2005*.

2a)☒ This action is **FINAL.**   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☐ Claim(s) *1,3,4,6,7,9-13,15,16,18,19 and 21-30* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3,4,6,7,11-13,15,16,18,19 and 23-30* is/are rejected.

7)☒ Claim(s) *9,10,21 and 22* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *25 April 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

      1.☒ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   In response to the office action from 6/14/2005, the applicant has submitted an

amendment, filed 11/14/2005, arguing to traverse the art rejection based on the limitation

regarding speech recognition parameters that are arranged in vectors corresponding to sampling

time-frames *(Amendment, Page 8)*. Applicant's arguments have been fully considered, however

the previous rejection is maintained due to the reasons listed below in the response to arguments.

Response to Arguments

2.   Applicant's arguments have been fully considered but they are not persuasive for the

following reasons:

With respect to the independent claims, the applicant argues that Nahumi *(U.S. Patent:*

5,699,478) fails to teach the replacement of one or more speech recognition parameters that have

undergone a transmission error, where the speech recognition parameters are arranged in vectors

corresponding to sampling time frames *(Amendment, Page 8)*. In response, the examiner notes

that the speech parameters in vector format *(Col. 6, Lines 1-21)* taught by Nahumi, which are

replaced upon detecting a transmission error *(Col. 6, Lines 36-58)*, correspond to sampling time

frames, as is required by the presently claimed invention. Specifically, the proceeding time

frame used in error correction in the example given by Nahumi (Col. 6, Line 59- Col. 7, Line

12), contains speech vector parameters that correspond to a current time frame and a previous time frame (redundant data for error correction). Thus, the speech parameters taught by Nahumi correspond to time *frames* as is required by the presently claimed invention. It appears as if the applicant is arguing that individual speech parameters are arranged in vector representation, each of which corresponds to a specific individual frame that does not contain any speech parameters corresponding to other frames. This feature is not recited in the presently claimed invention.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies *(i.e., arranging individual speech parameters in vector representation to correspond to a specific individual frame)* are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

In response to the applicant's arguments that Nahumi fails to teach replacement parameters from a following vector without error, the examiner points out that Nahumi teaches a properly received speech frame that follows an erased frame, which contains speech parameters *(vectors)* that are utilized in the reconstruction of the erased frame *(Col. 6, Line 59- Col. 7, Line 12)*.

In response to the applicant's arguments that Zingher et al *(U.S. Patent: 6,092,039)* teaches away from the invention taught by Nahumi, the examiner points out that Zingher provides no negative teachings directed towards the use of redundant information in error correction. In fact, Zinger teaches the use of channel coding for error correction, which includes redundant speech information *(Col. 20, Lines 42-48)*. Thus, since Zingher teaches the use of

redundancy in speech encoding and provides no negative teachings directed toward its use,

Zingher does not teach away from the invention taught by Nahumi.

The dependent claims further limit rejected independent claims, and thus, also remain

rejected.

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

4.   **Claims 1, 13, and 25-30** are rejected under 35 U.S.C. 103(a) as being unpatentable over

Nahumi *(U.S. Patent: 5,699,478)* in view of Zingher *(U.S. Patent: 6,092,039)*.

With respect to **Claims 1 and 13**, Nahumi discloses:

Identifying a group comprising one or more vectors that have undergone a transmission

error *(vector representation, Col. 6, Lines 1-21; and detecting a transmission error, Col. 6, Lines

36-58)*;

Replacing one or more speech parameters in the identified group of vectors, wherein he

one or more parameters in the identified group of vectors are replaced by respective replacement

parameters corresponding to one or more speech recognition parameters from a vector without

error received after the identified group of vectors *(Col. 6, Line 59- Col. 7, Line 12)*.

Although Nahumi teaches an error recovery technique similar to that of the present

invention, Nahumi does not teach the transmission of speech recognition vector parameters in a

distributed speech recognition system, however Zingher teaches a vocoder for use in an

automatic speech recognition system having a client and server *(Col. 5, Line 51- Col. 6, Line 13;*

and Fig. 6).

Nahumi and Zingher are analogous art because they are from a similar field of endeavor

in speech parameter coding. Thus, it would have been obvious to a person of ordinary skill in

the art, at the time of invention, to modify the teachings of Nahumi with the use of a vocoder in a

distributed speech recognition process to provide a practical application for the method of

Nahumi to achieve speech recognition in a narrow bandwidth channel (Zingher, Col. 6, Lines 9-

14) while providing necessary error correction taught by Nahumi *(Col. 1, Lines 44-57)* to

overcome possible channel errors which can degrade speech recognition accuracy *(Zingher,*

suggested use of error correction in DSR, Col. 20, Lines 42-48).

With respect to **Claims 25 and 26**, Zingher further discloses a wireless communication

link *(Col. 4, Lines 12-15).*

With respect to **Claims 27 and 29**, Nahumi in view of Zingher teaches the DSR system

featuring an error recovery means as applied to Claims 1 and 13. Additionally Zingher teaches

the use of mel cepstral coefficients as speech parameters *(Col. 5, Line 51- Col. 6, Line 13; and*

Fig. 6).

With respect to **Claims 28 and 30**, Zingher further recites:

Speech recognition parameters include logarithmic energy *(Col. 8, Lines 20-29).*

5.   **Claims 3 and 15** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nahumi

(U.S. Patent: 5,699,478) in view of Zingher *(U.S. Patent: 6,092,039)*, and further in view of de

Souza et al *(U.S. Patent: 5,884,261)*.

With respect to **Claims 3 and 15**, Nahumi in view of Zingher teaches the error correction

system and method that conceals errors by replacing speech parameters from a error-containing

frame with speech parameters from future correct frames, as applied to Claims 1 and 13.

Nahumi in view of Zingher does not teach that a speech parameter is replaced from a closest

frame, however de Souza teaches such a method (Col. 12, Lines 46-58).

Nahumi, Zingher, and de Souza are analogous art because they are from a similar field of

endeavor in speech parameter coding. Thus, it would have been obvious to a person of ordinary

skill in the art, at the time of invention, to modify the teachings of Nahumi in view of Zingher

with the means for replacing a missing speech vector with a vector from a closest frame as taught

by de Souza in order to provide an alternate means of recovering a missing frame vector *(de

Souza, Col. 12, Lines 48-53)*.

6.   **Claims 4 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Nahumi

(U.S. Patent: 5,699,478) in view of Zingher *(U.S. Patent: 6,092,039)*, further in view of de

Souza et al *(U.S. Patent: 5,884,261)*, and further in view of Ozawa *(U.S. Patent: 5,305,332)*.

Nahumi, Zingher, and de Souza teach the error correction system and method that

conceals errors by replacing speech parameters from a error-containing frame with speech

parameters from a closest frame, as applied to Claims 3 and 15. The combination of Nahumi,

Zingher, and de Souza does not specifically suggest a well-known method for error recovery

using interpolation, however Ozawa teaches such a method *(interpolating pitch and filter*

parameters from past and future proper frames to correct transmission errors, Col. 4, Lines 7-

12).

Nahumi, Zingher, de Souza, and Ozawa are analogous art because they are from a similar

field of endeavor in speech parameter coding. Thus, it would have been obvious to a person of

ordinary skill in the art, at the time of invention, to modify the teachings of Nahumi in view of

Zingher, and further in view of de Souza, with the use of interpolation in error recovery as taught

by Ozawa in order to provide improved error correction by using parameters from past and

future frames *(Ozawa, Col. 6, Lines 32-40)*.

7.   **Claims 6-7, 11-12, 18-19, and 23-24** are rejected under 35 U.S.C. 103(a) as being

unpatentable over Nahumi *(U.S. Patent: 5,699,478)* in view of Zingher *(U.S. Patent:*

6,092,039), and further in view of Yeldener et al *(U.S. Patent: 5,774,837)*.

With respect to **Claims 6 and 18**, Nahumi in view of Zingher teaches the error correction

system and method that conceals errors by replacing speech parameters from a error-containing

frame with speech parameters from future correct frames, as applied to Claims 1 and 13.

Nahumi in view of Zingher does not teach the method of error detection through comparison of a

speech estimate to a threshold, however Yeldener discloses:

An error mitigating method and apparatus, wherein determination of which speech

recognition parameter or parameters are to be replaced is performed by predicting fro vectors

received without error, a predicted value for each speech recognition parameter within the

identified group of vectors, and replacing those speech recognition parameters within the

identified group of vectors that are outside of a predetermined threshold relative to their

respective predicted value *(comparing an estimated pitch value of a frame to previous values to*

detect a variation in a speech signal indicative of an error, Col. 13, Lines 37-50).

Nahumi, Zingher, and Yeldener are analogous art because they are from a similar field of

endeavor in speech parameter coding. Thus, it would have been obvious to a person of ordinary

skill in the art, at the time of invention, to combine the method of estimating a pitch value and

comparing it to a threshold for error detection as taught by Yeldener with the error correction

system and method that conceals errors by replacing speech parameters from a error-containing

frame with speech parameters from future correct frames as taught by Nahumi in view of

Zingher to provide a means of further error detection for frame smoothing to improve the quality

of reproduced speech *(Yeldener, Col. 13, Lines 37-50).*

With respect to **Claims 7 and 19**, Yeldener teaches a means for changing parameters of a

frame if one parameter does not satisfy a threshold condition, as applied to Claims 6 and 18.

Claims 11 and 23 contain subject matter similar to Claims 6 and 18, and thus, are

rejected for the same reasons.

With respect to **Claims 12 and 24** Yeldener teaches the subject matter applied to Claims

6 and 18, wherein an error is detected in a three frame period.

Allowable Subject Matter

8.   **Claims 9-10 and 21-22** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

9.   The following is a statement of reasons for the indication of allowable subject matter:

With respect to **Claims 9 and 21**, the prior art of record fails to teach or specifically suggest the combination of the comparison of mel cepstral speech vectors that are within a predicted parameter value threshold to a set of reference vectors to find a best match vector and then using that best match vector to replace a mel cepstral speech vector that fulfills an error condition of being outside of a predicted parameter threshold with an error concealment system for use in a distributed speech recognition system performed over a network that uses a vector received after a detected error vector to determine the replacement best match vector.

Claims 10 and 22 further limit claims containing allowable subject matter, and thus, also contain allowable subject matter.

Conclusion

10.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after

the end of the THREE-MONTH shortened statutory period, then the shortened statutory period

will expire on the date the advisory action is mailed, and any extension fee pursuant to 37

CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing

date of this final action.

11.   The prior art made of record and not relied upon is considered pertinent to applicant's

disclosure:

Cox et al *(U.S. Patent: 6,775,652)*- teaches a method for interpolating bits from properly

received speech frames for error recovery of a lost frame in a distributed speech recognition

system.

12.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to James S. Wozniak whose telephone number is (571) 272-7632.

The examiner can normally be reached on M-Th, 7:30-5:00, F, 7:30-4, Off Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Wayne Young can be reached on (571) 272-7582. The fax phone number for the

organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent

Application Information Retrieval (PAIR) system. Status information for published applications

may be obtained from either Private PAIR or Public PAIR. Status information for unpublished

applications is available through Private PAIR only. For more information about the PAIR

system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR

system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

James S. Wozniak
12/21/2005

WAYNE YOUNG
SUPERVISORY PATENT EXAMINER